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Overweight and Obesity: Perception and associated risk factors among women in southern Morocco

Overweight and Obesity among women in southern Morocco

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Abstract

Aim: In this study, we aimed to identify the main risk factors associated with overweight and obesity among women in southern Morocco.
Material and Methods: The study was conducted in health centres in the southern region of Morocco. Data were collected using a questionnaire. In addition to socio-demographic information, physical activity was assessed using the International Physical Activity Questionnaire (IPAQ). Information on dietary habits was also collected using the Guideline Score of the French National Nutrition and Health Program (PNNS-GS). Anthropometric data (weight and height) were measured and perception was assessed using the Stunkard body shape assessment scale.
Results: A total of 576 were included in this study. Anthropometric data showed that 37.3% of women were normal weight, 33.9% (IC95% [30.03-37.77]) were overweight and 25.2% were obese (IC95% [21.65-28.75]). The study revealed that overweight was related to socio-demographic status, Sahrawi Arab ethnicity (OR= 1.82; IC95% [1.13-3.93], p=0.013) and mixed race (OR= 2.61, IC95% [1.47- 4.61], p=0.001). However, this relationship was not significant for eating habits and physical activity level. As for parity and maternal breastfeeding, there was a significant relationship with weight gain, as well as positive perception of overweight and desire to gain weight (p>0.001). However, the desire to lose weight protects against overweight (OR=0.46; IC95% [0.30-0.70])
Discussion: Reducing the magnitude of this public health problem requires strategies that address all the factors that can lead to weight gain in the population with a particular emphasis on young women.

Keywords

Overweight, Obesity, Perception, Risk Factors, Women

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Introduction

Overweight is a disease characterized by excess body fat. It is associated with the development of numerous comorbidities. Its worldwide prevalence has shown a significant increase in recent years. Overweight and obesity have become major public health problems worldwide. They have consequences on physical, psychological and social well-being. The impact of excess weight on health is well known. Indeed, it is a risk factor for type 2 diabetes, cardiovascular disease, hypertension, osteoarthritis and some forms of cancer [1].

The increase in the prevalence of overweight and obesity is thus a growing threat to health, affecting all age groups, ethnic groups and all social classes in all industrialized and developing countries.

In Morocco, women are the most affected by the phenomenon. Indeed, between 2011 and 2018, we note an increase in overweight from 51.4% to 63.4%. As for obesity, it has increased from 26.8% to 29.0% (available at: website: www.sante. gov. ma/Documents /2019/05/ Rapport). A literature review revealed that the risk factors are multiple and their control is complex. They are genetic, ethnic, cultural, and socio-demographic, linked to sedentary and dietary behaviours. Indeed, the incidence of obesity decreases with physical activity [2]. As for diet, studies have shown that the frequency of meals, their daily distribution and the composition of foods are involved in the development of overweight [3,4]. In addition, several studies have indicated that there is a strong association between perceived weight and weight control [5].

The aim of this study was to identify the main risk factors associated with overweight and obesity among women in southern Morocco.

Material and Methods

A multicentre cross-sectional study was conducted on 576 non-pregnant women and over 18 years of age. All consenting women were admitted to the study. Data collection was performed through a standardized questionnaire. It covers sociodemographic and student data, physical activity, diet and their perception of their weight load. Eating habits were assessed using an adequacy score derived from the Guideline Score of the French National Nutrition and Health Program (PNNS-GS) [6]. It is composed of basic questions on the frequency of consumption of major food groups (fruits and vegetables, starchy foods, meat and poultry, dairy products, etc.). Physical activity was assessed using the International Physical Activity Questionnaire (IPAQ), Short Version (available at website: www.ipaq.ki.se). The questionnaire also included anthropometric measurements. Body mass index (BMI) was calculated according to the thresholds adopted by the World Health Organization (available at website: www.who.int/fr/news-room/fact-sheets/detail/obesity-and-overweight). Participants' perception of body image is measured by the Body Image Rating Scale (Stunkard Figures) [7]. Data processing is done by the statistical data processing software SPSS version 13.0. Categorical variables were described in numbers and percentages and then compared using the chi-square and Fisher's exact tests according to the conditions for applying each of them. Quantitative variables were described as mean ± standard deviation. Factors associated with obesity/overweight were determined using binary logistic regression by calculating odds ratios (OR) and 95% confidence intervals (CI). In all analyses, a p-value ≤ 0.05 was considered statistically significant.

The study was approved by the Ethics Committee of Mohammed V University in Rabat under the number 50/20 dated 28/06/2020.

Results

The mean age of the study participants was 28.7±10.2 years. Table 1 shows that more than three-quarters of the women were younger than 37 years. The distribution of participants showed that more than half of them (n=309) were married. The proportion of single women was 37% (n=213). As for ethnicity, the results showed that 49% of the participants were of Arab ethnicity and 30% (n=170) were of Sahrawi Arab ethnicity. The distribution of women according to geographical origin showed that the majority (95.1%) lived in urban areas. As for occupation, housewives represented 40.1% (n=231), students 34.4% (n=198) and those with a salaried activity reached 25.5% (n=147). Among female civil servants or employees, 62% (n=93) were engaged in office work and 37.3% (n=56) in manual activity while standing.

Table 1. Distribution of the population by socio-demographic characteristics

Variables	Frequency	%
Age	28.7±10.2 years	
Ethnicity		
Sahrawi Arabic	170	29.5
Arabic	284	49.3
Amazigh	122	21.2
Marital status		
Married	309	53.6
Single	213	37.0
Divorced and widowed	54	09.4
Profession		
Housewife	231	40.1
Civil servant	97	16.8
Employee	50	8.7
Student	198	34.4
Monthly income (USD)		
Less than 278.02	174	30.2
[278.02-555.92]	188	32.6
[556.03-1111.95]	144	25.0
More than 1112.06	70	12.2
Education level		
Illiterate	74	12.8
Primary	153	26.6
Secondary	141	24.48
Higher	208	26.1
Weight status in Kg/m^2		
Underweight	21	03.6
Normal weight	215	37.3
Overweight	195	33.8
Obese	145	25.2

USD: United State Dollar

Monthly family income showed that about two-thirds (n=362) reported an income of at least 4999 MAD, while 25% (n=144) had an income between 556,03 and 1111,95 USD and only 12% (n=70) of the participants mentioned an income of more than 1112,06 USD. Data on educational levels showed that 36.1% (n=208) of the women had a higher level of education, and 26.6% (n=153) had no more than primary education. The study of the racial groups of the participants showed that 82% (n=471) of the women studied were white and 13% (n=74) were mixed race. The prevalence of obesity and overweight in our study was 25.2% and 33.8% respectively.

As for eating habits, 12.7% of the women could be considered small consumers of fruits and vegetables (less than 3.5 portions per day). On the other hand, 70.5% of the women ate at least five fruits and vegetables daily and 75.1% of the respondents ate starchy foods at least three times a day. Only 3.3% of participants reached the PNNS benchmark for dairy products, while the vast majority (88.7%) ate less. Nearly 80% of the women consumed foods from the “meat, fish, eggs” group once or twice a day. On the other hand, 13.1% of the participants consumed fish products at least twice a week.

As for the intensity of physical activity, more than half of the participants were not very active, while 3.1% were very active (Table 2).

Binary logistic regression analysis (Table 3) showed that an increase in women’s age by one year increased the risk of overweight by 11% to 18% (OR=1.15; 95% CI [1.11 - 1.18]).

Married women were not at risk of developing excess weight (OR= 0.84; CI95% [0.43- 1.62]). On the other hand, being single seemed to be protective against the development of overweight (OR=0.22; CI95% [0.11-0.43]). As for occupation, being a housewife (OR=15.87; CI95% [9.89-25.51]), a public servant (OR=14.29; [7.89-25.91]) or an employee (OR=14; CI95% [6.59-29.76]) was significantly associated with the development of excess weight. Being a student was more associated with a reduced risk of developing overweight (OR=0.07; CI95% [0.43-0.107]). Illiterate women had a 27.5-fold increased risk of developing excess weight (CI95% [12.34-61.29]), whereas women with higher education were protected (OR=0.08, CI95% [0.05-0.12]). Excess weight was correlated with Sahrawi Arab ethnicity (OR= 1.82; CI95% [1.13-3.93]), whereas Amazigh ethnicity was protective (OR= 0.65; CI95% [0.44-0.98]). Moreover, Arab ethnicity and physical activity intensity were not related to overweight. As for dietary habits, no relationship was found between excess weight and compliance with PNNS standards (OR=1.0069; CI95% [0.71-1.42]. However, the analyses showed that among the women studied, the habit of skipping a meal during the day was correlated with weight gain (OR=7.88; CI95% [5.03-12.33].

In addition, women who were satisfied with their body image (OR=0.235; CI95% [0.15-0.35]) and desire to lose weight had protective effects against excess weight (OR=0.46; CI95%

Table 2. Frequency of food consumption according to the PNNS guidelines (n=576)

Food groups	N	%
Fruit and vegetable consumption (n=576)		
Less than 3.5 / day	73	12.7
[3.5 to 5 [/ day	97	16.8
More than 5 / day	406	70.5
Starch Consumption (n=576)		
Less than 3 times / day	143	24.8
3 times / day	184	31.9
More than 3 times / day	249	43.2
Consumption of milk and milk products (n=576)		
<3 times/day	511	88.7
3 times / day	46	08.0
>3 times / day	19	03.3
Consumption of meat, poultry or eggs (n=576)		
<1 time / day	96	16.7
1 to 2 times / day	461	80.0
>2 times / day	19	3.3
Consumption of fish or other fish products (n=576)		
<2 times / week	501	86.9
2 to 3 times / week	70	12.2
>3 times / week	5	0.9
Consumption of sweetened products (n=576)		
<2 times/week	223	38.7
2 times/week to 1 time/day	210	36.5
>= 1 time/day	143	24.8
Intensity of physical activity		
Low	289	50.2
Moderate	269	46.7
Intense	18	3.1

Table 3. Bivariate analysis of factors related to overweight

Variables	N (%)	OR	IC* 95%	P
Age	--	1.145	[1.11 - 1.18]	0.0001
Marital status				
Married	220 (70.6)	0.84	[0.43- 1.62]	0.60
Single	80 (38.5)	0.22	[0.11-0.43]	0.0001
Other	40 (74.1)	1	-	-
Profession:				
Housewife	185 (80.1)	15.87	[9.89-25.51]	0.0001
Civil servant	76 (78.4)	14.29	[7.89 - 25.91]	0.0001
Employee	39 (78)	14.00	[6.59-29.76]	0.0001
Student	40 (20.2)	1	-	-
Ethnicity:				
S.A	111 (65)	1.82	[1.13-3.93]	0.013
Arabic	167 (59)	1.38	[0.90-2.12]	0.14
Amazigh	62 (51)	1	-	-
Physical activity				
Moderate physical activity ≥10 mn/d	111 (55)	0.77	[0.55-1.09]	0.144
Moderate physical activity ≤ 10 mn	229 (61)	1		
Respect of the PNNS benchmarks				
Yes	123 (59)	1.01	[0.71-1.42]	0.9687
No	217 (59)	1		
Desire to gain weight				
Yes	189 (94.5)	25.60	[13.47-48.64]	< 0.0001
No	151 (40)	1		
Satisfaction with body image				
Yes	43 (32)	0.23	[0.15-0.35]	< 0.0001
No	297 (67)			

*IC: 95% confidence interval; S. A: Sahrawi Arabic.

[0.30-0.70]). However, women with a desire to gain weight and those with a positive representation towards excessive weight had respectively had a risk of weight gain (OR=25.60; CI95% [13.47-48.64] and OR=1.60; CI95% [1.60-1.03]), (Table 3).

Discussion

Anthropometric data showed that the average body mass index (BMI) was 26.70 ± 5.36 Kg/m2. Thus, one out of three women was overweight and one out of four women was obese. These results confirm this trend in women worldwide [8]. Indeed, a study in Saudi Arabia showed an increase from 21% to 78% in women between 1992 and 2022 [9]. The study showed that the increase in age is related to overweight. This result is supported by other studies (available at: https://drees.solidarites-sante.gouv.fr/publications/les-dossiers-de-la-drees/premiers-resultats-de-lenquete-sante-europeenne-ehis-2019).

Similar to other research [10], the study found that married women had an elevated risk of being overweight (OR=3.03; 95% CI = [2.14- 4.27]). However, being single was protective against this risk (OR=0.25; 95% CI= [0.18- 0.36]). This result could be explained by the beginning of a change in perception towards corpulence and the adoption of lower risk behaviors for obesity as a consequence of their exposure to a Westernized culture [11]. In other results, the risk of overweight was related to the level of education and to the Saharawi ethnic group [12]. This finding is due to the lifestyle in general of Sahrawi women and to their behavior with respect to weight gain, which in their ancestral culture, is highly desired by this population.

In this study, a new result was recorded. Indeed, breastfeeding women had a high risk of becoming overweight (OR=5.28; CI95%= [3.47-8.05]), especially for a period of breastfeeding of one year (OR=3.83; CI95%= [1.41-10.38]). This is due to the excessive eating behaviors and sedentary habits of breastfeeding women in order to increase lactation. The literature has reported that exercise is protective against weight gain [13]. However, the results of the study reported no significant association between physical activity and overweight. This could be explained, on the one hand, by the difficulty of women to classify their physical activities and, on the other hand, the survey used the memory of the last seven days to assess the intensity of physical activity. Authors have reported that balanced diets may have a protective effect on the risk of developing chronic diseases [14] and that obesity is due to an imbalance between calories ingested and calories expended [15]. However, our results showed no relationship between a standard diet and weight gain. The discrepancy between the results could be explained by the fact that in Morocco, and especially in the southern provinces, the nutritional transition is in its early phase. Also, we could mention that meals in Morocco are served in collective dishes and prepared according to the traditional model (tagines, couscous and other Moroccan main meals). This made it difficult to quantify the food taken.

It was also noted that women who skipped meals were more likely to be overweight. These results are in line with those of the 2009 study showing that skipping meals disrupts hormonal and digestive secretions, leading to an increase in energy “storage” and therefore weight gain [10,16].

As for perception, our results showed that the majority of the women studied had correctly estimated their weight, contrary to the results of other studies conducted in Morocco and Tanzania [17,18].

For the perception of the most attractive image for men, the majority had chosen images 3 and 4 that represented normal weight. These results were similar to other studies [18].

Strengths of the study:

It was conducted at the level of Primary Healthcare Centers in all provinces of the region and is the first study to attempt to identify the dietary habits and assess the physical activity of women in the region. The main limitation is its cross-sectional nature.

Conclusion

Our results estimated the first prevalence of overweight in women of southern Morocco. The study focused on sociodemographic factors, factors related to physical inactivity, diet, family history, and the participants’ perception of the phenomenon studied. Reducing the magnitude of this public health problem requires good strategies that consider these major factors that can lead to weight gain, with particular emphasis on young women and students.

Scientific Responsibility Statement

The authors declare that they are responsible for the article’s scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

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